

1.0 Rationale

Sea lice are a parasitic copepod that can affect the health of farmed and wild fish stocks. Sea lice monitoring conducted on salmon farms provides information for effective management and treatment decisions at the farm level. The intent of this program to gather information from the monitoring of lice on all farms within specific fish health zones/areas looking at trends in lice levels, the management of sea lice on farmed salmon and integration of data on wild stock migration. This information will allow for area management of lice levels on farms.

A working group of fish health experts and veterinarians responsible for management of the aquaculture stocks will assist with integration and evaluation of the information collected and the effectiveness of the program.

The program has been divided by species due to differences in susceptibility to lice between farmed fish species.

Definitions:

Adult female – includes adult female lice with egg strings (i.e. gravid) or without egg strings

Mobile/Motile Lice – includes all motile stages: adult females (as above) and all other lice stages including adult male and preadults male/female lice

Year class – age of fish in saltwater. Year class one is defined the date of saltwater entry for the first fish on site plus 12 months. Year class two is defined as the remaining time in saltwater. Broodstock would be included in the year two group.

2.0 Sampling Protocol

Atlantic salmon marine sites:

Sampling will be conducted once a month for all sites. Sampling intensity will be increased to once every two weeks during wild smolt out migration. Timing for wild smolt migration in each sub zone will be determined from federal reports and literature and based on local knowledge.

Sampling will be conducted in three pens of 20 fish each (total 60 fish). Sample pens should include one index pen (i.e. first pen entered in the system and/or the pen with the highest probability of having lice based on site historical information) and two randomly selected pens per sample period.

Fish will be captured using a seine or other method that ensure representative sampling from the population. Handling should be minimized to avoid loss of lice. Method of handling should be recorded.

Fish should be placed in anesthetic bath or humanely euthanised before examination.

All fish will be examined for the presence of lice regardless of fish health status. Fish may be culled or otherwise removed from the population once lice counts have been recorded if appropriate.

All fish should be examined for the presence of lice and numbers of lice recorded. Lice counts should be recorded in the following categories:

- Lepeophtheirus spps. adult females (w & w/o egg strings)
- Mobile lice (adult female/male and preadult male and female)
- Chalimus (total), and
- Caligus (total)

When sampling is completed, water in anesthetic tote should be strained or examined to count lice remaining in the tote and lice numbers must be included in calculation of the pen total.

Average number of adult female lice, motile lice and total number of Caligus species should be calculated for the site.

Environmental information including dissolved oxygen, temperature and salinity at the surface (0-1 meters), 5, and 10 meters should be recorded.

Action levels for management should be 3 motile lice/sample during smolt out migration and 6 for remainder of year. Action that may be required includes husbandry changes, treatment and/or harvest.

Pacific Salmon Sites

Sampling should occur at all sites 4 times a year – once a quarter. Sampling should be conducted to ensure a representative sample of fish from the site is collected. Three pens per site should be sampled and 10 fish chosen for evaluation in each pen.

Lice counts and records of lice should be broken into the following categories:

- Lepeophtheirus salmonis - gravid females with egg strings
- Lepeophtheirus salmonis - motile lice including adult females, males, preadult males and females
- Chalimus
- Caligus spps.

Reporting to the Database

All industry participants will record the sea lice data as outlined above. It is the intention to develop a module of the existing industry Fish Health Database however until such time as it is completed data should be recorded as above to allow for evaluation and reporting of the information in a standardized format.

Reporting of findings to MAFF should include the average number of: 1. gravid lice, 2. motile lice and 3. Caligus species per subzone for each species of salmon, each year class, reported on a monthly basis for Atlantic salmon and quarterly for Pacific salmon.

Additional data that will be looked at includes the number of treatments per subzone or other actions taken to control sea lice by species in each sub-zone and for each year class. This information is available quarterly through the fish health database. Environmental data should be included for each year class in each sub zone in the report. Environmental data will be evaluated in light of trends and variation in lice levels.

Monitoring by MAFF

MAFF will monitor 25% of active Atlantic sites per quarter during the normal sea lice monitoring activities of the farm (approximately 12-15 farms/quarter). For Pacific salmon, 6.25% of the total number of sites sampled will be audited quarterly. Arrangements will be made to coordinate these activities with farm fish health staff such that sampling occurs at the same time as ongoing sea lice monitoring to avoid duplication and undue stress on fish.

At the selected sites, 10 fish will be selected from the 20 fish routine monitoring sample for evaluation by BCMAFF staff. The ten fish will be systematically examined by the BCMAFF Fish Health Technician and lice numbers enumerated and classified as outlined above. BCMAFF staff may also collect lice samples from anaesthetized or euthanised fish for periodic evaluation and confirmation of species of lice.

Public Reporting

Reports on lice levels will be made public by BCMAFF through their website. Reports will include average sea lice numbers by species in each subzone for each year class of fish. Environmental data and other data will be included as required.